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#2A Appeal Grant

**BEFORE THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BOARD OF PATENT APPEALS AND INTERFERENCES**

**In re Application of:**  
**Chesser, et al.**

**Serial No. 08/869,109**

**Filed: March 18, 1997**

**For: "Controlled Hydration of Starch  
In High Density Brine Dispersion"**

§ **Group Art Unit 1756**

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**Examiner: C. H. Kelley**

**Attorney Docket:**  
**154-9245-US**

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**BRIEF FOR APPELLANT**

Commissioner of Patents and Trademarks  
Washington, D.C. 20231



07-10-2000

U.S. Patent & TMO/TM Mail Rcpt. D.: #40

Sir:

Appellant hereby submits its brief on appeal from the decision rendered by the examiner finally rejecting claims 1, 3, 7, 9, 14-16, 21, 22, 26, 27, and 29-65, mailed February 9, 2000.

**REAL PARTY IN INTEREST**

The real party in interest in this appeal is the assignee, Baker Hughes Incorporated, who owns Baker Hughes Oilfield Operations, Inc., of which Baker Hughes INTEQ is a division.

**RELATED APPEALS AND INTERFERENCES**

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Appellant, its legal representative, and its assignee are unaware of any other appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this pending appeal.

### **STATUS OF CLAIMS**

All of claims 1, 3, 7, 9, 14-16, 21, 22, 26, 27, and 29-65 have been finally rejected, and a notice of appeal from the final rejection of all of these claims was filed February 9, 2000. Although claim "27" was appealed, Appellant submits that there is no claim 27, but that original claim 27 was renumbered as claim 26.

### **STATUS OF AMENDMENTS**

The examiner refused to amend claims 21 and 22. Applicant accepts the examiner's refusal. The claims currently pending are as reflected in the attached Appendix.

### **SUMMARY OF THE INVENTION**

The claimed invention provides a simple, efficient, and effective method for prehydrating water-soluble polymers so that the resulting precursor polymer dispersion can be simply mixed with and effectively hydrated by a high density brine in the field. It is not necessary to use heat or added solvating agents.

Water-soluble polymers are difficult to hydrate using a high density brine. As explained in the specification,

The viscosity of a drilling or completion brine typically is maintained using polymers, such as starches, derivatized starches, gums, derivatized gums, and cellulose. Although these polymers are water-soluble, they have a relatively low hydration rate in brines because very little water actually is available to hydrate the polymers, particularly in high density brines.

Specification, p. 2, ll. 11-15.

Water-soluble polymers normally are added to brines as dry powders or in a non-hydrating carrier fluid, such as tripropylene glycol. The starches are not prehydrated.

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The resulting viscosity and filtration control is determined by the interaction of the starch and brine, which in most cases is essentially none at ambient temperature. Specification, p. 3, ll. 17-21. Some have attempted to increase hydration using heat:

Heating a brine to at least about 140 °F will increase the hydration rate of starches and/or other water-soluble polymers in the brine. However, heating of brine is time consuming, expensive, and difficult to achieve in the field. Plus, heating of a brine will cause starch dispersed in the brine to build excessive viscosity when subjected to high wellbore temperatures.

Specification, page 2, ll. 16-20. The present invention overcomes the foregoing problems.

According to the present invention, (a) a relatively high concentration of water-soluble polymer is mixed with (b) a high density brine to form a dispersion of the polymer in which the polymer has a desired level of prehydration. The brine preferably is (c) a multivalent brine. The desired level of prehydration achieved using the combination of (a) and (b), and preferably (c), is such that simply mixing the dispersion of the prehydrated polymer with a high density brine, preferably in the field, provides the brine with adequate rheology and filtration control. In a preferred embodiment, the water soluble polymer is prehydrated by mixing about .5-4 lb/gal, preferably about 1-2 lb/gal, of the desired water-soluble polymer with a multivalent brine having a density of about 9-14 lb/gal, preferably about 11-13 lb/gal. Specification, p. 6, ll. 15-18.

### ISSUES

1. Has the examiner established that 1-3, <sup>7</sup>4, 9, 14, 39-40, and 59-64, to a method of prehydrating the polymers or making a precursor polymer dispersion, are obvious over GB 2084586?

2. Has the examiner established that 15, 21-23, 41, 42-56, and 65, to a method for treating a high density brine and a method for producing a high density brine using the precursor polymer dispersion are obvious over GB 2084586?
3. Has the examiner established that 26, 29-38, and 57-58 to a precursor polymer dispersion, are obvious over GB 2084586?
4. Has the examiner established that claims 16, to a method of treating a high density brine, is obvious over GB 2084586?

### GROUPING OF CLAIMS

*no P's* GROUP I: Claims 1, 7, 22, 39, 60, and 62, which contain functional language defining the amount of polymer used in a method of prehydrating water-soluble polymers, stand or fall together.

*0.5-4 lb pol/gal* GROUP II: Claims 2-3, 9, 14, 40, and 59, and 63-64, which give specific concentrations of the water-soluble polymer in a method of prehydrating the polymers or making a precursor polymer dispersion, stand or fall together.

*no P's* GROUP III: Claim 42, 45, 48, and 51-52 which uses functional language to define the amount of polymer used in a method for producing a high density brine;

*9-14 lbs salt/gal* GROUP IV: Claims 15, 21-22, 41, and 43-44, 46-50, 53-56 which give specific concentrations of the water-soluble polymer in a to a method for treating a high density brine and a method for producing a high density brine using the precursor polymer dispersion, stand or fall together.

*Disposition*  
*no P's* GROUP V: Claims 26, 31-33, and 36-38, 57-58 which contain functional language defining the amount of polymer used in a precursor polymer dispersion, stand or fall together.

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GROUP VI: Claims 29-30 and 34-35 which give specific concentrations of the water-soluble polymer in a precursor polymer dispersion, stand or fall together.

GROUP VII: Claim 16, which uses functional language to define various features of a method for treating a high density brine, including multivalency of the salt, stands or falls alone.

GROUP VIII: Claim 23, which specifies the density and the type of salt of claim 16, stands or falls alone.

Because the issues and the claim groups do not correspond, a designation is given at the end of the following headings to indicate which of the Groups relate to the particular issue.

### ARGUMENT

**ISSUE 1: Has the examiner established that claims 1-3, 7, 9, 14, 22, 39-40, 42, 45, 48, 51-52, 59, 60, and 62-64, to a method of prehydrating the polymers or making a precursor polymer dispersion, are obvious over GB 2084586? (Groups I-VIII)**

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#### **I. Summary of the Argument**

In order to establish a *prima facie* case of obviousness, “the prior art reference (or references when combined) must teach or suggest all [of] the claim limitations.” MPEP Section 2142. The examiner has not established a case of *prima facie* obviousness of any of the claims over GB 2084586 because the examiner has not pointed to a teaching or suggestion in GB 2084586, or in any other cited reference, of the following claim limitations:

- A. To add the water-soluble polymer to a **precursor brine** (as opposed to **water**) in order to achieve the desired level of prehydration, and then to mix the resulting precursor polymer dispersion (comprising the precursor brine) with a final brine (all claims);

- B. To mix about 0.5 - 4 pounds per gallon (claims 2, 14, 29, 34, 40, 43, 49, and 53), preferably about 1 - 2 pounds of the water soluble polymer per gallon of the precursor brine (claims 3, 15, 21, 30, 35, 41, 44, 47, 50, and 59); or
- B. To use a precursor brine that has a density of from about 9 to about 14 (claims 14-15, 21, 22, 31, 36, 41, 45-47, and 55) , preferably from about 11 to about 13 pounds per gallon (claims 32, 37, and 48-50); or,

The examiner also has not pointed to a teaching or suggestion, either in GB 2084586 or in another reference, to modify GB 2084586 to achieve these claimed limitations. MPEP 2143.01; *In re Brouwer*, 37 U.S.P.Q.2d 1663, 1666 (Fed. Cir. 1995). The examiner therefore has not established that the claims are *prima facie* obvious over GB 2084586. MPEP 2143.01.

## II. **The Examiner Has not Established a Case of *Prima Facie* Obviousness**

- A. The examiner has not pointed to a teaching in GB 2084586 that it is necessary to add the water soluble polymer to a **precursor brine** (as opposed to **water**) in order to achieve the desired level of prehydration, and then to mix the resulting precursor polymer dispersion (in the precursor brine) with a final brine (Groups I-VIII, all claims);

The present invention involves forming a “precursor polymer dispersion” by mixing (a) a relatively high concentration of a suitable water soluble polymer with (b) a **high density, preferably multivalent precursor brine**. The water soluble polymer becomes prehydrated by the water in the precursor brine to a level that permits the final brine to further hydrate the prehydrated polymer when the dispersion is simply mixed with the “final,” high density brine, in the field--without heating or additional solvating agents. The resulting final brine has adequate rheology and filtration control.

The examiner has not pointed to a teaching or suggestion in GB 2084586 (the “GB patent”) of the combination of (a) and (b). The GB patent teaches admixing a

“hydrophilic polymer and **water as, for example, fresh water, distilled water, etc.**”

Page. 2, ll. 5-6 (emphasis added). In other words, the examiner has pointed to a teaching or suggestion to form an initial **polymer/water** solution.

Initial contact of the water-soluble polymers with **water, alone**, does not achieve the claimed level of prehydration. As evidenced by the testimony of Billy Chesser:

When **fresh water** or aqueous solutions of monovalent salts, such as sodium chloride, were used to prehydrate the claimed water-soluble polymers, and those polymers were added to a final brine and the final brine subjected to heat equivalent to temperatures that might be experienced downhole, **those final brines tended to agglomerate and form a highly viscous mass with unsuitable rheology and filtration control properties.**

Chesser Decl., ¶ 6 (emphasis added). Clearly, a “highly viscous mass with unsuitable rheology and filtration control properties” does not meet the claimed limitation that the final brine “maintain an effective level of a property . . . selected from the group consisting of rheology, fluid loss control, and a combination thereof” (all claims).

For this reason, all of the claims (except claim 16, discussed under Issue 4) require the water-soluble polymer to be mixed with a “precursor **brine** . . . consisting essentially of cations of one or more multivalent alkaline earth metals.” When a sufficient quantity of the water-soluble polymer is initially contacted with a **multivalent brine**, as claimed, the final brine does not agglomerate or form a viscous mass upon exposure to temperatures such as those experienced downhole.

Contrary to the examiner’s position, p. 2, ll. 35-38 of GB 2084586 does not teach or suggest the use of a **brine** as an initial contact solution for the polymer. The cited lines clearly state that “the polymer, water and inorganic salt are mixed **as above** to hydrate the polymer and **form the polymer/water suspension.**” (Emphasis added.)

The only method described “**above**” involves **initially mixing the polymer with water.**

In other words, the method described “**above**” uses water as an initial contact solution to form “a uniform dispersion of the polymer suspension in the water.” Page 2, l. 12-13. The inorganic salt is added in “the next step of the method.” Page 2, l. 14. The examiner has not pointed to any teaching or suggestion that the “water” with which the “hydrophilic polymers” in the GB patent is mixed contains a salt, much less a multivalent salt, as required by the claims.

The examiner has not pointed to a teaching or suggestion in the GB patent that would motivate a person of ordinary skill in the art to substitute a multivalent brine for GB’s water as the initial contact solution for the polymers. Nor has the examiner pointed to a teaching or suggestion, either in the GB patent or in another reference, to modify the GB patent to replace GB’s water with the claimed multivalent precursor brine. MPEP 2143.01; *In re Brouwer*, 37 U.S.P.Q.2d 1663, 1666 (Fed. Cir. 1995). The examiner therefore has not established that the claims are *prima facie* obvious over the GB patent. MPEP 2143.01.

- B. The examiner has not pointed to a teaching or suggestion in GB 2084586 of the specific limitations of the claims of Group II, namely, the use of about 0.5 - 4 pounds per gallon (claims 2, 14, 29, 34, 40, 43, 49, and 53), preferably about 1 - 2 pounds of the water soluble polymer per gallon of the precursor brine (claims 3, 15, 21, 30, 35, 41, 44, 47, 50, and 59)(Groups II, IV, and VI).
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The examiner has not pointed to a teaching or suggestion in GB 2084586 to use a relatively high concentration of the water-soluble polymer to form the precursor polymer dispersion--whether the precursor fluid used is water or brine. The examiner clearly has not pointed to a teaching or suggestion in GB 2084586 to mix 0.5-4 pounds of the polymer per gallon of a precursor brine, much less 1-2 pounds of the polymer per gallon of a precursor brine.



Even if the fluid used to contact the water-soluble polymers in GB 2084586 was a brine--which it is not--GB 2084586 teaches that

the amount of the hydrophilic polymer used in the method of the present invention will be such as to provide a final concentration of from about 0.25 to 30 g per litre regardless of whether the ultimate well servicing fluid comprises (a) the polymer/water suspension prepared by mixing the polymer, water, and the inorganic salt, or (b) the polymer, water, inorganic salt and an amount of an aqueous brine.

GB patent, page 2, ll. 46-49. This quantity, 0.25-30 g./l., is **only 0.0021 - 0.16 pounds of polymer per gallon of liquid--much less than 0.5 lb/gal.**--the smallest quantity specified in claims 14-15, 21, 23, 31, 36, 41, and 45-47.

For this additional reason, the examiner has not established a case of *prima facie* obviousness of claims 2, 14, 29, 34, 40, 43, 49, and 53 over GB 2084586. The same even more true of claims 3, 15, 21, 30, 35, 41, 44, 47, 50, and 59, which specify the use of even more water-soluble polymer--1-2 lbs. of the polymer per gallon of the precursor brine. The examiner also has not pointed to a teaching or suggestion, either in the GB patent or in another reference, to modify the GB patent to use a higher concentration of the polymer to form the polymer dispersion. MPEP 2143.01; *In re Brouwer*, 37 U.S.P.Q.2d 1663, 1666 (Fed. Cir. 1995). The examiner therefore has not established that the foregoing claims are *prima facie* obvious over the GB patent. MPEP 2143.01.

- C. The examiner has not pointed to a teaching in GB 2084586 to use a precursor brine that has a density of from about 9 to about 14 (claims 14-15, 21, 23, 31, 36, 41, 45-47, and 55), preferably from about 11 to about 13 pounds per gallon (claims 32, 37, and 48-50) (Not a Group)

Since the examiner has not pointed to a teaching or suggestion in the GB patent to use a brine--as opposed to water--to form the precursor polymer dispersion, the examiner necessarily has not pointed to a teaching or suggestion to use a brine that is (a)

multivalent, and/or (b) has a relatively high density. The examiner clearly has not pointed to a teaching or suggestion in GB 2084586 to form the precursor polymer dispersion using a multivalent brine at a density of from about 9 to about 14 pounds per gallon, preferably from about 11 to about 13 pounds per gallon. The examiner also has not pointed to a teaching or suggestion, either in the GB patent or in another reference (a) to modify the GB patent to replace GB's water with a brine having such density, or (b) that it would be desirable to make such a modification. MPEP 2143.01; *In re Brouwer*, 37 U.S.P.Q.2d 1663, 1666 (Fed. Cir. 1995). The examiner therefore has not established that the claims are *prima facie* obvious over the GB patent. MPEP 2143.01.

**ISSUE 2: Has the examiner established that 15, 21-23, 41, and 42-48, to a method for treating a high density brine and a method for producing a high density brine using the precursor polymer dispersion are obvious over GB 2084586? (Groups III, IV, and VIII)**

Claims 15, 21-23, 41, and 42-48 each contain one or more of the limitations discussed above, and the examiner has not established a case of *prima facie* obviousness of claims 15, 21-23, 41, and 42-48 for the same reasons.

**ISSUE 3: Has the examiner established that claims 26, 29-38, and 57-58, to a precursor polymer dispersion, are obvious over GB 2084586? (Groups V and VI)**

The examiner has not established a case of *prima facie* obviousness of claims 26, 29-38, and 57-58 over the GB patent because the examiner has not pointed to a teaching or suggestion in the GB patent of sufficient quantity of a precursor polymer dispersed in a multivalent brine to produce polymer particles having the required level of prehydration.

The examiner may contend that the polymers dispersed in the solutions of the GB patent inherently have the same level of prehydration as the polymers in the claimed precursor polymer dispersion. However, "[t]he fact that a certain result or characteristic

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may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic.” [citations omitted] **MPEP 2112.** “In relying upon a the theory of inherency, **the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.” MPEP 2112.**

The examiner has given no basis-in-fact or technical reasoning why the claimed level of prehydration **necessarily** would be achieved by mixing GB’s polymer with water and then adding salt. The examiner therefore has failed to establish a case of inherency of claims 26, 29-38, and 57-58 over the GB patent. MPEP 2112.

The evidence of record also rebuts any such conclusion. As explained in the specification:

Where a brine is high density, *e.g.*, 11.6 lb/gal CaBr<sub>2</sub>, the initial particle dispersion of the starch is limited. As a result, a significant particle size is maintained and the degree of hydration is limited. These limitations are alleviated if the starch is dispersed in the brine in the manner herein described.

Page 4, ll. 11-14. In other words, the specification teaches that the use of the claimed method to prehydrate the polymers increases the degree of hydration and reduces the particle size of the polymers in a dispersion--at least in relation to polymers that are simply mixed with a high density brine. Billy Chesser’s testimony establishes that the use of water or a monovalent salt as the initial contact fluid negatively impacts rheology and filtration control properties:

When **fresh water** or aqueous solutions of monovalent salts, such as sodium chloride, were used to prehydrate the claimed water-soluble polymers, and those polymers were added to a final brine and the final brine subjected to heat equivalent to temperatures that might be experienced downhole, **those final brines tended to agglomerate and form a highly viscous mass with unsuitable rheology and filtration control properties.**

Chesser Decl., ¶ 6 (emphasis added). This indicates that the required level of prehydration is **not** achieved when water is used to form the initial polymer dispersion, as in the GB patent.

The foregoing arguments are true with respect to all of the claims to a precursor polymer dispersion, but even more so with respect to the claims of Group VI, which give specific concentrations of the water-soluble polymer in a precursor polymer dispersion.

**ISSUE 4: Has the examiner established that claims 16, to a method of treating a high density brine, is obvious over GB 2084586? (Groups VII and VIII)**

Claim 16 also is to a method of treating a high density brine, but does not contain a specific limitation to the use of a multivalent brine to form the precursor polymer dispersion. Claim 16 does, however, require the precursor brine/water-soluble polymer dispersion to be “effective at a sufficient concentration in a final brine having a second salt content to improve a property of said final brine selected from the group consisting of rheology, fluid loss control, and a combination thereof.” Since the polymers must control rheology and fluid loss, it is logical to conclude that the type of brine used necessarily causes the polymers to achieve the required level of prehydration, and as a result, that the polymers will not form a “highly viscous mass” at high temperatures.

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The examiner simply has not pointed to a teaching or suggestion to “provid[e] a precursor brine having a first salt content; [and] mix[] a water-soluble polymer with said precursor brine” in order to prehydrate the water soluble polymers so that they can be mixed with the final brine and--without the use of heat or additional solvating agents--improve rheology and/or filtration control while avoiding the formation of a highly viscous mass at high downhole temperatures. Nor has the examiner pointed to anything

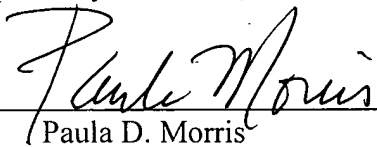
in the GB patent, or in another cited reference, that would motivate a person of ordinary skill in the art to modify the GB patent to achieve this result. The examiner therefore has not established a case of *prima facie* obviousness of claim 16.

Claim 23 (Groups VIII) is allowable for the additional reason that it specifies the density and the type of salt to be used in performing the method of claim 16.

### CONCLUSION

For all of the foregoing reasons, Appellant submits that the examiner did not establish a case of *prima facie* obviousness of any of the claims over the GB patent. Alternately, Appellant submits that any case of *prima facie* obviousness was rebutted by Billy Chesser's testimony and the evidence contained in the specification. Appellant respectfully requests that the Board reverse the rejection of all of the pending claims.

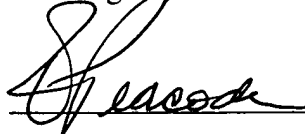
Respectfully submitted,

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### CERTIFICATE OF MAILING

I hereby certify that this paper, along with any referred to as being attached or enclosed, is being forwarded to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, via First Class Mail this the 2<sup>nd</sup> day of July, 2000.



**BEFORE THE UNITED STATES PATENT AND TRADEMARK OFFICE  
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§ Group Art Unit 1756

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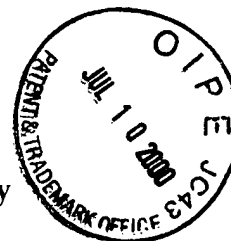
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**Examiner: C. H. Kelley**

**Attorney Docket:  
154-9245-US**



**APPENDIX**

1. A method for prehydrating a water soluble polymer for addition to a brine for use in drilling and completion operations comprising:

providing a precursor brine comprising an aqueous solution of a first salt at a first density, said first salt comprising cations consisting essentially of cations of one or more multivalent alkaline earth metals; and

mixing said water-soluble polymer with said precursor brine at a first concentration and under first conditions, wherein said first density, said first concentration, and said first conditions are effective to produce a precursor polymer dispersion comprising particles of said water-soluble polymer at a level of prehydration;

wherein, addition of a sufficient quantity of said precursor polymer dispersion to a final brine comprising an aqueous solution of a second salt at a final density produces a final polymer dispersion comprising a second concentration comprising final particles of said water-soluble polymer at a final level of hydration, said second concentration and said final level of hydration being effective at downhole conditions to maintain an effective level of a property of said final brine selected

from the group consisting of rheology, fluid loss control, and a combination thereof.

2. A method for producing a precursor polymer dispersion for addition to a brine for use in drilling and completion operations comprising:

providing a precursor brine comprising an aqueous solution of a salt at a first density, said salt comprising cations consisting essentially of cations of one or more multivalent alkaline earth metals; and

mixing a first concentration of a water-soluble polymer with said precursor brine under first conditions, wherein said first concentration is from about 0.5 pounds per gallon to about 4 pounds of said water-soluble polymer per gallon of said precursor brine, wherein said first density, said first concentration, and said first conditions are effective to produce a precursor polymer dispersion comprising particles of said water-soluble polymer at a level of prehydration;

wherein, upon addition of a sufficient quantity of said precursor polymer dispersion to a final brine, said precursor polymer dispersion produces a second dispersion comprising a second concentration of final particles of said water-soluble polymer at a final level of hydration, said second concentration and said final level of hydration being effective at downhole conditions to maintain an effective level of a property of said final brine selected from the group consisting of rheology, fluid loss control, and a combination thereof.

3. The method of claim 1 wherein said first concentration is from about 1 to about 2 lb of said water-soluble polymer per gallon of said precursor brine.

Claims 4-6 were canceled.

7. The method of claim 1 wherein

said salt is selected from the group consisting of calcium chloride, calcium bromide, and combinations thereof.

Claim 8 is canceled.

9. The method of claim 3 wherein

said salt is selected from the group consisting of calcium chloride, calcium bromide, and combinations thereof.

Claims 10-13 were canceled.

14. A method for producing a precursor polymer dispersion for addition to a final brine for use in drilling and completion operations comprising:

providing a precursor brine comprising an aqueous solution comprising a salt selected from the group consisting of calcium chloride, calcium bromide, and combinations thereof, said aqueous solution comprising said salt at a first density of from about 9 to about 14 pounds per gallon; and

mixing from about 0.5 to about 4 pounds per gallon of a water-soluble polymer with said precursor brine under first conditions sufficient to produce a precursor polymer dispersion comprising a first concentration of particles of said water-soluble polymer at a level of prehydration;

wherein, upon addition of a sufficient quantity of said precursor polymer dispersion to a final brine, said precursor polymer dispersion produces a second concentration of final particles of said water-soluble polymer at a final level of hydration, said second concentration and said final level of hydration being effective at downhole conditions to maintain an effective level of a property of said final brine selected



from the group consisting of rheology, fluid loss control, and a combination thereof.

15. A method for treating a high density brine for use in drilling and completion operations comprising:

providing a precursor brine comprising an aqueous solution comprising a salt consisting essentially of cations of one or more multivalent alkaline earth metals, said aqueous solution comprising said salt at a first density of from about 9 to about 14 pounds per gallon;

mixing about 1 to about 2 pounds per gallon of a water-soluble polymer with said precursor brine under first conditions sufficient to produce a precursor polymer dispersion comprising a first concentration of particles of said water-soluble polymer at a level of prehydration;

wherein, upon addition of a sufficient quantity of said precursor polymer dispersion to a final brine, said precursor polymer dispersion produces a second concentration of final particles of said water-soluble polymer at a final level of hydration, said second concentration and said final level of hydration being effective at downhole conditions to maintain an effective level of a property of said final brine selected from the group consisting of rheology, fluid loss control, and a combination thereof.

16. A method for treating a high density brine for use in drilling and completion operations comprising:

providing a precursor brine having a first salt content;

mixing a water-soluble polymer with said precursor brine at a sufficient concentration and under conditions sufficient to produce a precursor polymer dispersion effective at a sufficient concentration in a final brine having a second salt content to improve a property of said final brine selected from the group consisting of rheology, fluid loss control, and a combination thereof; and mixing said sufficient concentration of said precursor polymer dispersion with said final brine.

Claims 17-20 were canceled.

21. The method of claim 15 wherein said salt is selected from the group consisting of calcium chloride, calcium bromide, and combinations thereof.

22. The method of claim 16 wherein said salt is selected from the group consisting of calcium chloride, calcium bromide, and combinations thereof.

23. The method of claim 16 wherein said precursor brine comprises a salt selected from the group consisting of calcium chloride, calcium bromide, and combinations thereof; and said first salt content comprises a density of between about 9-14 pounds per gallon.

Original claims 24-26 were canceled.

26. A precursor polymer dispersion comprising:  
an aqueous solution of a salt at a first density, said salt comprising cations consisting essentially of cations of one or more multivalent alkaline earth metals; and  
a first concentration of particles of a water-soluble polymer at a level of prehydration;

wherein, addition of a sufficient quantity of said precursor polymer dispersion to a final brine comprising an aqueous solution of a second salt at a final density produces a final polymer dispersion comprising a second concentration comprising final particles of said water-soluble polymer at a final level of hydration, said second concentration and said final level of hydration being effective at downhole conditions to maintain an effective level of a property of said final brine selected from the group consisting of rheology, fluid loss control, and a combination thereof.

Claim 28 was canceled.

29. The dispersion of claim 26 wherein said first concentration is from about 0.5 to about 4 pounds per gallon.

30. The dispersion of claim 26 wherein said first concentration is from about 1 to about 2 pounds per gallon.

31. The dispersion of claim 26 wherein said density is in the range of from about 9 to about 14 pounds per gallon.

32. The dispersion of claim 26 wherein said density is from about 11 to about 13 pounds per gallon.

33. The dispersion of claim 26 wherein said salt is selected from the group consisting of calcium chloride, calcium bromide, and combinations thereof.

34. The dispersion of claim 29 wherein said salt is selected from the group consisting of calcium chloride, calcium bromide, and combinations thereof.

35. The dispersion of claim 30 wherein said salt is selected from the group consisting of calcium chloride, calcium bromide, and combinations thereof.

36. The dispersion of claim 31 wherein said salt is selected from the group consisting of calcium chloride, calcium bromide, and combinations thereof.

37. The dispersion of claim 32 wherein said salt is selected from the group consisting of calcium chloride, calcium bromide, and combinations thereof.

38. The dispersion of claim 26 wherein said one or more multivalent alkaline earth metals are divalent alkaline earth metals.

39. The method of claim 1 wherein said one or more multivalent alkaline earth metals are divalent alkaline earth metals.

40. The method of claim 2 wherein said one or more multivalent alkaline earth metals are divalent alkaline earth metals.

41. The method of claim 15 wherein said one or more multivalent alkaline earth metals are divalent alkaline earth metals.

42. A method for producing a brine for use in drilling and completion operations comprising:

providing a precursor brine comprising an aqueous solution of a first salt at a first density, said first salt comprising cations consisting essentially of cations of one or more multivalent alkaline earth metals; and

mixing a water-soluble polymer with said precursor brine at a first concentration and under first conditions, wherein said first density, said first concentration, and said first conditions are effective to produce a precursor polymer dispersion comprising particles of said water-soluble polymer at a level of prehydration;

wherein, addition of a sufficient quantity of said precursor polymer dispersion to a final brine comprising an aqueous solution of a second salt at a final density produces a final polymer dispersion comprising a second concentration comprising final particles of said water-soluble polymer at a final level of hydration, said second concentration and said final level of hydration being effective at downhole conditions to maintain an effective level of a property of said final brine selected from the group consisting of rheology, fluid loss control, and a combination thereof; and mixing said sufficient quantity of said precursor polymer dispersion with said final brine.

43. The method of claim 42 wherein said first concentration is from about 0.5 pounds to about 4 pounds per gallon.

44. The method of claim 42 wherein said first concentration is from about 1 pound to about 2 pounds per gallon.

45. The method of claim 42 wherein said first density is from about 9 to about 14 pounds per gallon.

46. The method of claim 43 wherein said first density is from about 9 to about 14 pounds per gallon.

47. The method of claim 44 wherein said first density is from about 9 to about 14 pounds per gallon.

48. The method of claim 42 wherein said first density is from about 11 to about 13 pounds per gallon.

49. The method of claim 43 wherein said first density is from about 11 to about 13 pounds per gallon.

50. The method of claim 44 wherein said first density is from about 11 to about 13 pounds per gallon.

51. The method of claim 42 wherein said one or more multivalent alkaline earth metals are divalent alkaline earth metals.

52. The method of claim 42 wherein said salt is selected from the group consisting of calcium chloride, calcium bromide, and combinations thereof.

53. The method of claim 43 wherein said salt is selected from the group consisting of calcium chloride, calcium bromide, and combinations thereof.

54. The method of claim 44 wherein said salt is selected from the group consisting of calcium chloride, calcium bromide, and combinations thereof.

55. The method of claim 46 wherein said salt is selected from the group consisting of calcium chloride, calcium bromide, and combinations thereof.

56. The method of claim 49 wherein said salt is selected from the group consisting of calcium chloride, calcium bromide, and combinations thereof.

57. A precursor polymer dispersion comprising:

a precursor brine comprising an aqueous solution of a first salt at first density,  
said first salt comprising cations consisting essentially of cations of one or more multivalent alkaline earth metals;

a precursor polymer dispersion in said precursor brine comprising a first concentration of particles of a water-soluble polymer at a level of prehydration;

wherein, mixing of a sufficient quantity of said precursor polymer dispersion with a final brine comprising an aqueous solution of a second salt at a final density produces a second concentration of final particles of said water-soluble polymer at a final level of hydration, said second concentration and said final level of hydration being effective at downhole conditions to maintain an effective level of a property of said final brine selected from the group consisting of rheology, fluid loss control, and a combination thereof.

58. The precursor polymer dispersion of claim 57 wherein said one or more multivalent alkaline earth metals are divalent alkaline earth metals.

59. The method of claim 2 wherein said first concentration is from about 1 pound to about 2 pounds per gallon.

60. The method of claim 1 wherein said density is from about 9 to about 14 pounds per gallon.

61. The method of claim 2 wherein said density is from about 9 to about 14 pounds per gallon.

62. The method of claim 1 wherein said density is from about 11 to about 13 pounds per gallon.

63. The method of claim 2 wherein said density is from about 11 to about 13 pounds per gallon.

64. The method of claim 14 wherein said density is from about 11 to about 13 pounds per gallon.

65. The method of claim 15 wherein said density is from about 11 to about 13 pounds per gallon.